**What is Claimed:**

1. A system for transporting voice, video and data signals in the local access loop between a central office location and a plurality of subscribers, comprising:

optical video distribution circuitry for combining CATV television signals and DBS television signals into optical video signals at a first wavelength;

telephony/data distribution circuitry for combining telephony signals and packet data signals into optical telephony/data signals at a second wavelength;

optical multiplexing circuitry for combining the optical video signals at a first wavelength with the optical telephony/data signals at a second wavelength to form combined optical signals carrying information at two distinct wavelengths;

a passive optical network for transporting the combined optical signals to the subscribers; and

a plurality of home network units coupled to the passive optical network for receiving the combined optical signals, and for demultiplexing and converting the combined optical signals into a plurality of electrical signals corresponding to the CATV television signals, the DBS television signals, the telephony signals, and the packet data signals.

2. The system of claim 1, wherein the optical video distribution circuitry comprises:

an optical multiplexer for combining the CATV television signals and the DBS television signals into optical video signals; and

a first optical booster stage for amplifying the optical video signals.

3. The system of claim 1, wherein the optical video distribution circuitry further comprises:

a splitter coupled to the output of the first optical booster stage; and

a plurality of additional optical booster stages coupled to the output of the splitter for further amplifying the optical video signals.

4. The system of claim 2, wherein the first optical booster stage is an Erbium-doped fiber amplifier.

5. The system of claim 3, wherein at least one of the plurality of additional optical booster stages are Erbium-doped fiber amplifiers.

6. The system of claim 1, wherein the first wavelength is approximately 1550 nanometers.

7. The system of claim 1, wherein the CATV television signals occupy a bandwidth of approximately 50 to 750 megahertz.

8. The system of claim 1, wherein the DBS television signals occupy a bandwidth of approximately 950 to 2050 megahertz.

9. The system of claim 1, wherein the telephony/data distribution circuitry comprises:

a telephony interface platform for interfacing with a telephone switch;

a data switch for interfacing with a source of packet data signals; and

a plurality of optical interface units coupled to the telephony interface platform and the data switch for converting the telephony signals into packet telephony signals, for multiplexing and demultiplexing the telephony packet signals with the packet data signals, and for converting the signals to and from optical telephony/data signals at a second wavelength.

10. The system of claim 9, further comprising an element management system coupled to the telephony interface platform.

11. The system of claim 9, wherein the digital telephone switch is coupled to the telephony interface platform via a plurality of DS-1 telephony signals.

12. The system of claim 9, wherein the data switch is an Ethernet switch.

13. The system of claim 12, wherein the Ethernet switch is coupled to the plurality of optical interface units via a plurality of 100 Base-T connections.

14. The system of claim 9, wherein the passive optical network includes a plurality of transport fibers, and wherein each optical interface unit is coupled to four or more of the transport fibers.

15. The system of claim 9, wherein the second wavelength is 1310 nanometers.

16. The system of claim 9, wherein the data switch is coupled to a PPPOE service gateway.

17. The system of claim 9, further comprising a drop processor unit for interfacing the optical network units to the telephony interface platform.

18. The system of claim 9, wherein the optical interface units convert the telephony signals into packetized telephony signals.

19. The system of claim 18, wherein the packet data signals are Internet packet data signals.

20. The system of claim 19, wherein the packetized telephony signals and the packetized data signals are both Ethernet packet signals.

21. The system of claim 21, further comprising an Ethernet ID field within each of the Ethernet packet signals for identifying whether a particular packet is a packetized telephony signal or a packetized data signal.

22. The system of claim 21, wherein each home network unit has an associated Ethernet MAC address for routing telephony data signals from the central office to the proper home network unit.

23. The system of claim 21, wherein each optical interface unit has an associated Ethernet MAC address for routing telephony data signals from the home network units to the proper optical interface unit.

24. The system of claim 1, wherein the passive optical network comprises:

a plurality of transport fibers coupled to the optical multiplexing circuitry;

a plurality of drop fibers coupled to the home network units, wherein each home network unit is coupled to one drop fiber; and

a plurality of passive optical splitters coupled between the transport fibers and the drop fibers.

25. The system of claim 24, wherein the passive optical splitters are at least 4 to 1 splitters.

26. The system of claim 24 wherein the length of the transport fibers is less than approximately 33,000 feet.

27. The system of claim 24, wherein the length of the drop fibers is less than approximately 3,300 feet.

28. The system of claim 24, wherein the passive optical splitters are mechanically coupled to the transport fibers via fusion splicing.

29. The system of claim 1, wherein the home network units include connections for servicing a plurality of telephones, analog television equipment, digital television equipment, and at least one computer.

30. The system of claim 1, wherein the connection from the home network unit to the at least one computer is an Ethernet data connection.

31. The system of claim 30, wherein the Ethernet data connection is a 10Base-T connection.

32. The system of claim 1, wherein the home network units further include circuitry for transmitting upstream telephony and Internet data signals back over the passive optical network to the central office.

33. The system of claim 32, wherein the upstream telephony and Internet data signals are converted into optical telephony/data signals at the second wavelength.

34. The system of claim 33, wherein the telephony and Internet data signals are packetized signals.

35. The system of claim 34, wherein the home network unit prioritizes the transmission of the telephony packet signals over the Internet data packet signals.

36. The system of claim 1, further comprising an optical mainframe coupled between the optical multiplexing circuitry and the passive optical network for routing optical signals to a plurality of transport fibers.

37. The system of claim 1, wherein the home network units further include an external power module coupled to the AC line of the subscriber's premises.

38. A method of transmitting telephony, data and video signals in the local access loop between a central office location and a plurality of subscriber homes, comprising the steps of:

(A) multiplexing the telephony signals with the data signals to form telephony/data signals;

(B) converting the telephony/data signals into optical telephony/data signals;

(C) converting the video signals into optical video signals;

(D) combining the optical telephony/data signals and the optical video signals into a combined optical signals;

(E) transmitting the combined optical signals over a passive optical network that is terminated with a plurality of home network units within each subscriber's home;

(F) extracting the optical video signals and the optical telephony/data signals from the combined optical signals;

(G) demultiplexing the telephony signals and the data signals from the telephony/data signals; and

(H) routing the video signals, the telephony signals, and the data signals to devices within the subscriber's home.

39. The method of claim 38, further comprising the steps of:

(I) transmitting telephony signals and data signals from the subscriber's devices to the home network unit within the subscriber's home;

(J) multiplexing the telephony signals and the data signals into upstream telephony/data signals;

(K) converting the upstream telephony/data signals into upstream optical telephony/data signals; and

(L) transmitting the upstream optical telephony/data signals from the home network unit to the central office via the passive optical network.

40. A digital laser transmitter circuit for controlling the drive current to a laser diode having a back-facet monitor photodiode, comprising:

a current driver coupled to the laser diode;

an analog feedback loop coupled between the back-facet photodiode and the current driver for measuring the average power level of light output from the laser diode and for maintaining a constant optical power output level;

a digital feedback loop coupled between the back-facet photodiode and the current driver for comparing the peak power level of light output from the laser diode to a ratio of the average power level and for synthesizing a laser modulation level to the current driver that keeps the peak power level between two average threshold levels; and

an echo-cancellation circuit for monitoring echo signals at the transmitter and for injecting an echo-cancellation signal that compensates for the monitored echo signals.

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41. A method of transmitting data over a passive optical network that couples a central office terminal to a plurality of home network units (HNUs), comprising the steps of:

providing a continuous downstream transmission from the central office terminal to the HNUs, wherein the continuous downstream transmission includes a burst ID field for carrying information that instructs the HNUs how to transmit data upstream to the central office terminal, and a data field that contains downstream data information to the HNUs; and

providing a burst upstream TDMA transmission from each of the HNUs to the central office, wherein each of the HNUs is allocated a particular upstream time-slot for communication to the central office.

42. The method of claim 41, wherein each burst upstream TDMA transmission from the HNUs includes: a preamble for providing clock recovery and synchronization; a data block containing the upstream data from the HNU; and a postamble for indicating when a particular HNU has completed transmitting.

43. The method of claim 42, further comprising the step of:

providing a guard time interval between the postamble of one HNU and the preamble of the next HNU.